

## 6. Claims

1. An information processing system having a storage having a logical unit logically assigned to a physical device, and a plurality of information processing apparatuses which are selectively connected to said storage and request data input/output from said storage, said information processing system requesting data input/output via a plurality of paths as communication channels to said logical unit, wherein said information processing apparatus comprises:

an error detection section which detects an error occurred on a path according to a result of a data input/output request;

a changeover evaluation section which detects occurrence of error on a specified number of paths to determine whether or not to change an information processing apparatus connected to said storage even before occurrence of errors on all paths; and

a changeover section which uses a determination result from said changeover evaluation section to change said information processing apparatus requesting data input/output from said logical unit.

2. The information processing system according to claim 1, wherein

said error detection section specifies a type of said detected error; and

said server changeover evaluation section changes the number of paths as a criterion for changing said information processing apparatus according to said specified error type.

3. The information processing system according to claim 2, wherein

said error detection section specifies an instantaneous break error resulting from a path's instantaneous break; and

said server changeover evaluation section assigns a large value to the number of paths used as a criterion for changing an information processing apparatus due to said instantaneous break error than a value assigned to the number of paths used as a criterion for changing an information processing apparatus due to the other errors.

4. The information processing system according to claim 2, wherein

said error detection section specifies a performance error resulting from path performance degradation, and

said server changeover evaluation section assigns a smaller value to the number of paths used as a criterion for changing an information processing apparatus due to said performance error than a value assigned to the number of paths used as a criterion for performing failover due to the other errors.

5. The information processing system according to claim 1, wherein

said error detection section specifies a type of said detected error, and

said server changeover evaluation section uses a combination of said plurality of specified types of errors to determine whether or not to change said information processing apparatus.

6. The information processing system according to claim 5, wherein

said server changeover evaluation section uses a result of totaling scores defined for types of errors occurring on a path to determine whether or not to change said information processing apparatus.

7. The information processing system according to claim 1, wherein

said server changeover evaluation section changes the number of paths used as a criterion for changing said information processing apparatus according to a load state of a data input/output request.

8. The information processing system according to claim 1, wherein

said server changeover evaluation section provides a time slot causing a high load state of a data input/output

request with a smaller value assigned to the number of paths used as a criterion for changing said information processing apparatus than a value assigned to that for the other time slots.

9. An information processing system having a storage having a logical unit logically assigned to a physical device, and a plurality of information processing apparatuses which are selectively connected to said storage and request data input/output from said storage, said information processing system requesting data input/output via a path as a communication channel to said logical unit, wherein said information processing apparatus comprises:

- a path selection section which selects a path assigned with a data input/output request transmitted to said storage;

- an I/O transmission/reception section which transmits a data input/output request issued to a path selected by said path selection section;

- an operation statistics management section which totals process states of normally terminated data input/output requests;

- an error management section which detects an error occurred on said path, specifies a type of said error, and totals the number of detected errors for each path and error type;

- a changeover evaluation section which detects occurrence of error on a specified number of paths to determine whether or not to change an information processing apparatus connected to said storage even before occurrence of errors on

all paths; and

a changeover section which uses a determination result from said changeover evaluation section to change said information processing apparatus requesting data input/output from said logical unit.

10. An information processing apparatus which is selectively connected to a storage having a logical unit logically assigned to a physical device and requests data input/output via a logical path as a communication channel to said logical unit, said apparatus comprising:

an error detection section which uses a result of a data input/output request to detect an error occurred on a path;

a changeover evaluation section which detects occurrence of error on a specified number of paths to determine whether or not to change an information processing apparatus connected to said storage even before occurrence of errors on all paths; and

a changeover section which uses a determination result from said changeover evaluation section to change said information processing apparatus requesting data input/output from said logical unit.

11. The information processing apparatus according to claim 10,

wherein

said error detection section specifies a type of said

detected error, and

said server changeover evaluation section uses said specified error type to change the number of paths as a criterion for changing said information processing apparatus.

12. The information processing apparatus according to claim 10,

wherein

said error detection section specifies a type of said detected error, and

said server changeover evaluation section uses a combination of said plurality of specified types of errors to determine whether or not to change said information processing apparatus.

13. The information processing apparatus according to claim 10,

wherein

said server changeover evaluation section changes the number of paths used as a criterion for changing said information processing apparatus according to a load state of a data input/output request.

14. A control method of changing an information processing apparatus which requests data input/output from a storage having a logical unit logically assigned to a physical device via a logical path as a communication channel to said logical unit

and is connected to said storage, said method comprising the steps of:

detecting an error occurred on a path according to a result of a data input/output request;

detecting occurrence of error on a specified number of paths to determine whether or not to change an information processing apparatus connected to said storage even before occurrence of errors on all paths; and

using a determination result from said changeover evaluation section to change said information processing apparatus requesting data input/output from said logical unit.

15. The control method according to claim 14, further comprising the steps of:

specifying a type of said detected error; and

changing the number of paths as a criterion for changing said information processing apparatus according to said specified error type.

16. The control method according to claim 14, further comprising the steps of:

specifying a type of said detected error, and

using a combination of said plurality of specified types of errors to determine whether or not to change said information processing apparatus.

17. The control method according to claim 14, further comprising

the steps of:

changing the number of paths used as a criterion for changing said information processing apparatus according to a load state of a data input/output request.

18. A control method of changing an information processing apparatus which requests data input/output from a storage having a logical unit logically assigned to a physical device via a logical path as a communication channel to said logical unit and is connected to said storage, said method comprising the steps of:

detecting an error occurred on a path according to a result of a data input/output request;

storing the number of detected errors in an error management table;

referencing said error management table;

determining whether or not the number of detected errors exceeds a specified criterion for each path;

specifying an error-prone path based on a result of comparing said number of detected errors with said specified criterion; and

issuing a command to change said information processing apparatus based on a result of comparing said number of specified error-prone paths with a specified threshold.

19. A program to control an information processing apparatus which requests data input/output from a storage having a logical



unit logically assigned to a physical device via a logical path as a communication channel to said logical unit, said program comprising:

means for detecting an error occurred on a path according to a result of a data input/output request;

means for detecting occurrence of error on a specified number of paths to determine whether or not to change an information processing apparatus connected to said storage even before occurrence of errors on all paths; and

means for using a determination result from said changeover evaluation section to change said information processing apparatus requesting data input/output from said logical unit.

20. The program according to claim 19 further comprising:

means for specifying a type of said detected error;  
and

means for changing the number of paths as a criterion for changing said information processing apparatus according to said specified error type.

21. The program according to claim 19 further comprising:

means for specifying a type of said detected error,  
and

means for using a combination of said plurality of specified types of errors to determine whether or not to change said information processing apparatus.

22. The program according to claim 19 further comprising:

means for changing the number of paths used as a criterion for changing said information processing apparatus according to a load state of a data input/output request.